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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Klaus Grossmann

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12/22/2008

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EXAMINER

BROWN, COURTNEY A

ART UNIT

PAPER NUMBER

1616

MAIL DATE

DELIVERY MODE

12/22/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/508,837

Applicant(s)

GROSSMANN ET AL.

Examiner

COURTNEY BROWN

Art Unit

1616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-14 is/are pending in the application.
- 4a) Of the above claim(s) 13 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO-893)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Receipt of Amendments/Remarks filed on July 29, 2008 is acknowledged. Claim 1 stands cancelled. Claim 13 was amended. Claims 2-14 are pending. Claims 2-12 are being examined for patentability.

Restriction

The finality of the restriction requirement for claims 2-14, filed on April 29, 2008, has been withdrawn because it was improperly made final by the Examiner.

The Examiner acknowledges receipt of Applicant's response to the restriction requirement filed on February 4, 2008. Applicant elected, with traverse, Group I, claims 2-10, drawn to a method for identifying herbicidally active substances. Applicant traversed on the grounds that the Examiner has failed to consider the claims as a whole and has further mischaracterized the corresponding special technical feature. Applicant's arguments, see pages 7-9, filed February 4, 2008, with respect to claims 2-12 have been fully considered and are persuasive and claims 11 and 12 have been rejoined to the elected Group I. The restriction requirement for claims 13 and 14 is maintained and has been addressed in the arguments below.

Examiner's Response to Applicant's Arguments/Remarks

Applicant's arguments, see page 7, filed July 29, 2008, with respect to the restriction requirement of claim(s) 2-14 have been fully considered and are not persuasive. Applicant argues that independent claims 2, 11 and 13 which relate to

a.) methods of identifying compounds having herbicidal activity based on their effect on specific enzymatic activity;

b.) methods of controlling undesired vegetation by applying compounds affecting specific enzymatic activity; and

c.) compounds affecting specific enzymatic activity

share the same corresponding special technical feature. However, Applicant failed to explicitly point out and identify said technical feature in the agreements filed on July 29, 2008. Therefore, the Examiner cannot properly respond to Applicant's arguments. However, to further clarify the Examiner's position, the Examiner wants to point out that the compound of formula (I) in claims 13 and 14 is not used in the method for identifying herbicidally active substances as disclosed in claims 2-12. Therefore, the invention of the instant application lacks a special corresponding technical feature and the claims cannot be said to have unity of invention.

Rejections and/or objections not reiterated from the previous Office Action are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set of rejections and/or objections presently being applied to the instant application.

New Rejections

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant claims a method for identifying herbicidally active substances comprising bringing one or more enzymes selected from the group consisting of tryptophan aminotransferase, indole-3-pyruvate decarboxylase, and indole-3-acetaldehyde oxidase into contact with one or more test substance(s) to the abovementioned enzymes or to the nucleic acid sequence which encodes one of the abovementioned enzymes. The Examiner understands the active step of binding said test substance to the aforementioned enzymes. However, Applicant has not clearly set forth the active step of binding said nucleic acid sequence with the said test substance. Therefore, with regards to permitting the binding of the aforementioned test substance (s) to the nucleic acid sequence which encodes one of the abovementioned enzymes, it is unclear to the examiner what applicant intends as the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bounga. (WO 01/20020 A2) and Finn et al. (Bioorganic and Medicinal Chemistry Letters) in view of Arteca (Plant Growth Substances: Principle and Applications).

Applicant's Invention

Applicant claims a method for identifying a herbicidally active substance comprising: a.) bringing one or more enzymes selected from the group consisting of the enzymes tryptophan aminotransferase, indole-3-pyruvate decarboxylase, and indole-3-acetaldehyde oxidase into contact with one or more test substances to permit binding to the enzymes or the nucleic acid sequence, which encodes the said enzymes; b.) detecting if the test substance reduce or block transcription, translation or expression of at least one of the said enzymes; and c.) detecting if the test substance(which could be tryptophan, a tryptophan derivative, indole-3-pyruvate, an indole-3- pyruvate derivative, and indole-3- acetaldehyde or an indole-3-acetaldehyde derivative) reduces or blocks activity of at least one of the said enzymes or detecting if the test substance binds to one of the said enzymes(preferably tryptophan aminotransferase). Applicant also claims a method of identifying herbicidally active substance that comprises: a.) treating a test compound with a plant cell lysate which comprises at least one of the said enzymes or; b.) treating a test compound with one of the said enzymes which are either partially or fully purified and; c.) the enzymatic activity of at least one of the said enzymes is determined in comparison with one of the other said enzymes that has or has not been treated with the test compound and selecting the compounds that reduce or block the activity of at least one of the said enzymes.

***Determination of the scope and the content of the prior art
(MPEP 2141.01)***

Bounga et al. teach a method for screening and identification of compounds or compositions useful as herbicides, growth regulators or fungicides involving the addition of the compound or composition to be screened or identified to a culture or culture area of a yeast strain transformed with and expressing one or more plant cell cycle control genes or mutants (phytoyeast) as well as to a control yeast strain; and, determining the effect on the phenotype (growth and/or cell division and/or cell size/shape) of said phytoyeast compared to said control yeast. Bounga et al. further teach a biological screening assay (high throughput system) comprising the use of said phytoyeast expressing plant cell cycle control proteins to identify novel compounds or compositions that affect yeast or phytoyeast phenotype. Bounga et al. also teach methods for producing a pesticide, herbicide, plant growth regulator or fungicide, comprising the steps of (a) identifying a compound or composition as defined above or a derivative or homologue thereof, and, (b) mixing said compound, composition, derivative or homologue thereof with an acceptable carrier and the use of said compounds or compositions for inhibiting or stimulating plant growth and/or for increasing crop yield and/or for preventive or curative protection of the plant against fungal infection (abstract).

Finn et al. teach that enzymes involved specifically in tryptophan biosynthesis are potential herbicide targets. Specifically, Finn et al. teach that inhibitors of the final enzyme in the tryptophan biosynthesis pathway (tryptophan synthase) are herbicidal (see page 2297).

***Ascertainment of the difference between the prior art and the claims
(MPEP 2141.02)***

The difference between the invention of the instant application and that of Bounaga et al. and Finn et al. is that the instant invention requires the use of enzymes selected from the group consisting of tryptophan aminotransferase, indole-3-pyruvate decarboxylase, and indole-3-acetaldehyde oxidase in order to identify herbicidally active substances as opposed to the use of tryptophan synthase. For this reason, the teaching of Arteca is joined. Arteca teaches that tryptophan transaminase (i.e. tryptophan aminotransferase) and indolepyruvate decarboxylase (i.e. indole-3-pyruvate decarboxylase) are key enzymes in the pathway in which tryptophan is converted to indole acetic acid (IAA) (see pages 48 and 49). Arteca teaches that auxins such as indole acetic acid (IAA) are plant growth substances (see pages 46-47) and have many physiological effects in plant systems which include cellular elongation, phototropism, geotropism, apical dominance, root initiation and elongation, ethylene production, and fruit growth (see pages 53-57).

Finding of prima facie obviousness

Rationale and Motivation (MPEP 2142-2143)

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to combine the teachings of the cited references to arrive at a method of identifying herbicidally active substances. It would be obvious to one of ordinary skill

in the art to substitute tryptophan synthase in the method taught by Finn et al. with one of the enzymes taught by Arteca (tryptophan aminotransferase and indole-3-pyruvate decarboxylase) as potential herbicidal targets. One would be motivated to substitute tryptophan aminotransferase or indole-3-pyruvate decarboxylase for tryptophan synthase as a herbicidal target because, as taught by Arteca, tryptophan aminotransferase or indole-3-pyruvate decarboxylase are key enzymes in the pathway in which tryptophan is converted to indole acetic acid (IAA), an important plant growth substance. Further, it would be obvious to one of ordinary skill in the art to combine the teaching of Bounaga et al. and Arteca to arrive at a method of identifying herbicidally active substances because Bounaga et al. teach a method of identifying herbicidal active compounds comprising the addition of a test substance to a culture area of yeast strain expressing one or more plant cell cycle control genes. Arteca teaches that auxins such as indole acetic acid (IAA) are plant growth substances (see pages 46-47) and have many physiological effects in plant systems which include cellular elongation. One of ordinary skill in the art would have been motivated at the time of the instant invention to make this combination in order to receive the expected benefit of using the methods of identifying potential herbicides as taught by Bounaga et al. and Finn et al. using tryptophan aminotransferase and indole-3-pyruvate decarboxylase as herbicide targets due to the understanding of the role of indole acetic acid as a plant growth substance as well as the roles that tryptophan aminotransferase and indole-3-pyruvate decarboxylase play in the indole acetic acid biosynthetic pathway as taught by Arteca.

Examiner's Response to Applicant's Remarks

Applicant's arguments, see pages 9-15, filed July 29, 2008, with respect to the rejection(s) of claim(s) 2-12 under 35 USC § 103 over Ward (WO 99/67402 A2) in view of Koga (Biochemica et Biophysica Acta) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found art references that positively recite a method for identifying herbicidally active substances and a method for controlling undesired vegetation.

Conclusion

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR Only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Courtney Brown, whose telephone number is

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571-270-3284. The examiner can normally be reached on Monday-Friday from 8 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Courtney A. Brown
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Technology Center 1600
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| /Johann R. Richter/
Supervisory Patent Examiner, Art Unit 1616